

Report
HQ Fitzwilliam Fwd
"Sonic Balloon Test, Kwajalein"
May 17, 1948

HEADQUARTERS FITZWILLIAM FORWARD
c/o Commander, Task Group 7.2
APO 187, c/o Postmaster
San Francisco, Calif.

17 May 1948

SONIC BALLOON TEST, KWAJALEIN

Inclosure G to FITZWILLIAM FORWARD Report

The Watson Laboratories of Air Materiel Command arranged for one (1) of its sonic balloon teams to participate in the FITZWILLIAM project as a mobile team to operate in the Central Pacific, at KWAJALEIN, GUAM and HICKAM FIELD, HAWAII, in that order, changing location for each of the three (3) explosions.

The purpose of this exploratory test was as follows: first, to determine if an atomic explosion's compressional waves are generated in the sound channel existing between 50,000 and 70,000 feet (such waves would conceivably travel unimpeded for long distances in this channel without touching the earth's surface); second, to determine whether a sound pick-up unit suspended from a floating balloon could detect compressional waves (possibly undetected by similar sound units at the earth's surface) by virtue of the decreased background noise in the high-level sound channel.

Balloons were made of high grade plastic, were of tear-drop shape, and were twenty-five (25) feet at their largest sea-level diameter. The sonic unit was a combination microphone-transmitter which was suspended from the balloon and picked up sound waves, transmitting them to a ground directional antenna connected to a radiosonde receiver (standard SCR 658 air weather radio receiver). The transmitted sound impulses were recorded on two (2) Esterline-Angus recorders.

A dribble constructed of a five (5) gallon tin incorporating a metered jet to allow a predetermined spillage rate of high grade kerosene-ethylene-glycol mixture was attached to the balloon. This was designed to counteract the helium gas seepage thru the surface pores of the plastic balloon. This metered loss of ballast and controlled the rising rate of the balloon at 500 to 600 feet a minute.

Ground sonic equipment consisted of World War II sound ranging devices utilized to pick up sound waves from an explosion traveling along the earth's surface.

A radio receiver was used to obtain explosion time notification code signals from the ENIWETOK radio station.

The balloon launching site had to have a down-wind clearance of about 1000 feet to lay out the 100 foot risers and cables to which were attached the microphone-transmitter and dribbler units. Also the site had to be sheltered from the wind to prevent damage to the balloon while it was being

inflated. At KWAJALEIN a wind-break was constructed through the courtesy of the island commander, Captain Vest, USN. At a predetermined time, the balloon was inflated with a fixed amount of helium gas to raise it to an altitude of from 50,000 to 60,000 feet where it floated at a constant level. The balloon was cautiously launched and guided until it cleared all ground obstacles. Electrical power for the microphone-transmitter was provided through wet-cell batteries, especially constructed to prevent freezing. The balloon was tracked visually by use of theodolites. Prior to the actual test on KWAJALEIN on X-day (15 April 1948) two (2) practice runs were made to minimize chance of failure and to improve operating techniques.

The transportation requirement was for air lift to transport the team of six (6) scientists and twelve (12) thousand pounds of equipment from BELMAR, NEW JERSEY to KWAJALEIN, GUAM, HAWAII and then back to BELMAR, NEW JERSEY. The Air Materiel Command provided three (3) aircraft, a C-54, a B-29, and a B-17, and crews, under the direction of Captain Stanley C. Lewis, from the 4149th AFBU, MIDDLETOWN, PENNSYLVANIA. The C-54 was also utilized in carrying Tracerlab personnel and equipment to KWAJALEIN and GUAM. Maintenance assistance was afforded by the local base and tactical organizations.

The mobile team personnel was assembled and partially trained at Watson Laboratories. The team arrived at KWAJALEIN 31 March 1948; departed for NORTH FIELD, GUAM, on 16 April 1948; for HICKAM FIELD on 3 May 1948; and was scheduled to depart from HAWAII for its home station on Z plus one (1) day.

The balloon team and aircraft crew personnel were as follows:

BALLOON TEAM:

Dr. Albert P. Crary	"Q" clearance	Physicist
Mr. Charles S. Schneider	"Q" clearance	Meteorological Engineer
Mr. John W. Alden	"P" clearance	Radio Engineer
Mr. John A. Moulden	"P" clearance	Radio Repairman
Mr. Murry Hackman	"P" clearance	Meteorological Engineer
Mr. James Smith	"P" clearance	Meteorological Engineer

B-29 CREW

Captain Stanley C. Lewis	Pilot (Flight Commander)
1st Lieutenant Randall S. Kane	Co-Pilot
1st Lieutenant Wm. L. Adams	Navigator
M/Sergeant W. L. Halliday	Engineer
M/Sergeant R. A. Kabaste	Radio Operator
T/Sergeant R. A. Cox	Ass't Radio Operator
T/Sergeant L. D. Moon	Ass't Engineer

C-54 CREW

Captain John P. Clowry	Pilot
1st Lieutenant Richard Mesher	Co-Pilot
1st Lieutenant Chas. A. Lamana	Navigator
S/Sergeant James Brau	Engineer
S/Sergeant L. H. Campbell	Radio Operator
Sergeant George L. Fratwell	Ass't Engineer

B-17 CREW

1st Lieutenant Owen B. Dubell	Pilot
1st Lieutenant Thomas F. Carroll	Co-Pilot
1st Lieutenant John Mertzen	Navigator
Sergeant W. R. Rice	Engineer

Time notification signals were required and provided in order to afford sufficient time to make necessary launching preparations, and to position the balloons just a few minutes prior to the predetermined arrival of the explosion sound wave. Headquarters FITZWILLIAM FORWARD furnished ARPACAS 3-1 and 3-2 by officer courier. The team experienced no difficulty in obtaining the time signals.

Reports required of the team were a brief statement as to positive or negative results of the tests, and notification of team movement to it's several locations. Reports of results were made to Headquarters FITZWILLIAM FORWARD and to AFMSW-1.

Results of the KWAJALEIN test were as follows: balloon-borne equipment results were positive and ground equipment results were questionable. An accurate final analysis and evaluation report will be submitted upon Dr. Crary's return to Watson Laboratories, including an accurate determination of results.

Due to time limitation and pending a thorough evaluation of results, the following recommendations, of necessity, should be considered tentative:

1. Before departing for field locations, a survey should be made to determine the best balloon launching sites, giving due consideration to shelter from high velocity and gusty winds, and sufficient clear space to lay-out shroud lines and control cables thus affording clear passage of the instruments which are suspended about one hundred (100) feet below the balloon.

2. That an SCR 658, radiosonde receiver be included in the team equipment list. For these tests, a receiver had to be borrowed from the air weather station at each location. This presented a problem because each station had only one (1) receiver and it was needed by the station personnel for upper air sounding operations. This necessitated selecting the best possible launching site adjacent to the weather station. Also, this precluded selection of a site without a weather station.

Memo

Brig Gen Tom C. Rives to Maj Gen
Curtis LeMay

Subj: Relief of Major R.T. Crane as
Project Officer for MOGUL and
TORRID

June 18, 1946

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TSELT

18 June 1946

MEMORANDUM FOR: Major General Curtis LeMay

SUBJECT: Relief of Major R. T. Crane as Project Officer for
MOGUL and TORRID

1. In compliance with General Spaatz' directive, I contacted Dr. M. Ewing at Columbia University on 15 June 1946 and discussed the proposed relief of Major R. T. Crane as project officer on projects MOGUL and TORRID.
2. Dr. Ewing was exceedingly pleasant and agreed to the relief of Major Crane, asking only that it be done in such a way as to cause as little embarrassment to any of the parties concerned as possible. I advised him that the matter would be handled diplomatically.
3. I then discussed with Dr. Ewing the subject of a successor to Major Crane and suggested to him that Colonel Marcellus Duffy, a Regular Army officer and well-qualified on meteorological research and development work, might be made available for this duty. Dr. Ewing advised that he believed that he could work well with Colonel Duffy if he is assigned to this work. It was further agreed that as soon as a project officer is finally selected, a conference would be held with Dr. Ewing and the new project officer and Colonel Maier and Colonel Graul in order that there will be a clear understanding as to the objectives to be accomplished.

TOM C. RIVES
Brig. General, USA
Chief, Electronic Subdivision
Engineering Division

Noted by General Spaatz.

Memo
Maj Gen Curtis E. LeMay to Maj Gen
L.C. Craigie
April 16, 1947

16 April 1947

Major General L. C. Craigie
Chief, Engineering Division
Air Materiel Command
Wright Field, Dayton, Ohio

Dear Bill,

Attached is the action on your letter requesting deferment of foreign service for some of your people. I hope this solves your personnel problem for the time being. I am still waiting for the study on Wright Field people ordered to school this fall.

Sincerely,

CURTIS E. LeMAY
Major General, U. S. Army
Deputy Chief of Air Staff for
Research and Development

Incl.

Memo fr. A-1, 14 Apr 47

Colonel Oscar C. Maier, O-16096

Retention: Indefinite. No known replacement in the AAF.

Duties: Chief, Electronic Plans Section, Electronic Subdivision. This officer should be retained in his present assignment due to the background of knowledge and experience which he has with reference to electronic research and development as well as meteorological research and development and the physics of the upper air. Colonel Maier has completed all requirements for a Ph. D. degree from the California Institute of Technology except for six months residency. During the period 1 February 1945 to 1 January 1946, Colonel Maier had been Commanding Officer of Watson Laboratories in charge of research and development of ground radar, radio and electronics equipment peculiar to the Army Air Forces, previous to which he was in command of various Signal Corps laboratories. Furthermore, he has complete technical knowledge and understanding of the projects being carried on by Watson Laboratories and Cambridge Field Station, which can only be achieved by years of active participation in the actual research and development of that particular type of electronic ground equipment.

Colonel Marcellus G. Duffy, O-18373

Retention: Indefinite. No known replacement in the AAF.

Duties: Assistant Chief, Electronic Plans Section, Electronic Subdivision. This officer has an extensive background and knowledge in meteorological and electronic research and development. He is a graduate of M.I.T. in meteorology. Colonel Duffy was liaison officer from the Commanding General, AAF, to the Chief Signal Officer for duty in connection with meteorological equipment for the period 1942-1946. During this period he set up AAF requirements, standards and training programs for weather equipment and personally followed this equipment from the laboratories to its introduction in all combat theaters. From September 1946 to January 1947, Colonel Duffy was in charge of applied propagation of compressional and magnetic waves at Watson Laboratories. At the present time, Colonel Duffy is monitoring the upper air research program for the AAF in addition to his duties as Assistant Chief of the Electronic Plans Section. With the Air Force competing against other services in the upper air research program, guided missiles and meteorological research, a competent, practical and theoretical officer is considered essential in the Plans Section, Electronic Subdivision.

Colonel Ralph L. Wassell, O-22329

Retention: Indefinite. No known replacement in the AAF.

Duties: Chief of Operations for Power Plant Laboratory. In this capacity he is responsible directly to the Laboratory Chief for the planning and execution of the entire engine development program. Specifically, he is responsible for supervision of the Rotating Engine Branch and the Non-Rotating Engine Branch. In order to successfully execute his responsibilities, Colonel Wassell must coordinate and approve the initiation of all research and development projects for